

ABSTRACT OF THE DISCLOSURE

A method of forming a non-oxide thin film includes introducing a work function reducing agent onto a surface of a sputter target facing into a substrate in a process chamber, providing an inert gas into the process chamber, ionizing the inert gas, thereby generating a plurality of electrons, disintegrating a plurality of negatively charged ions from the sputter target, and forming the non-oxide thin film on the substrate from the negatively charged ions.